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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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04/12/2001

Tomohiko Matsuura

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EXAMINER

BHATNAGAR, ANAND P

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/832,953

Applicant(s)

MATSUURA, TOMOHIKO

Examiner

Anand Bhatnagar

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 16 and 17 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04/12/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1 applicant extracts only a single characteristic point but uses a plurality of characteristic points to detect an edge. This is indefinite since examiner is unsure if multiple points or a single characteristic point should be extracted and/or single/multiple characteristic point(s) is/are needed to detect an edge.

Claim 1 recites the limitation "said characteristic points." There is insufficient antecedent basis for this limitation in the claim. Examiner will address this claim as best understood.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doi et al. (U.S. patent 5,343,390) and Takeo et al. (U.S. patent 4,962,539).

Regarding claim 1: Doi et al. discloses an irradiation field extracting method of extracting an irradiation field from a radiation image (Doi et al.; col. 1 lines 15-21 and col. 3 lines 20-26), comprising the steps of:

extracting a characteristic point in the radiation image for detecting an irradiation field edge (Doi et al.; fig. 1B elements 103 and 104, col. 3 lines 20-26 and col. 7 lines 40-45, wherein

the rib cage and diaphragm edges are first determined and used to extract the peripheral edge of the lungs. The edges of the rib cage and the diaphragm are read as the "characteristics points" since they are composed of many pixels/points and the peripheral edge of the lungs is read as the irradiation field edge.).

detecting an edge portion of said irradiation field on the basis of said characteristic points (Doi et al.; fig. 1B elements 103 and 104, col. 3 lines 20-26 and col. 7 lines 40-45, wherein the rib cage and diaphragm edges are first determined and used to extract the peripheral edge of the lungs. The edges of the rib cage and the diaphragm are read as the "characteristics points" since they are composed of many pixels/points and the peripheral edge of the lungs is read as the irradiation field edge.).

Doi et al. discloses to extract selected edges, of the ribs and the diaphragm, in a radiation image which is used to detect the periphery of the lungs in the radiation image. Doi et al. does not disclose to use a geometric pattern to detect the characteristic points (read as rib and diaphragm edges in Doi et al.) in an image. Takeo et al. teaches to detect patterns in an image by using different two valued masks, which are layout patterns, in order to detect a pattern in a radiograph image (col. 5 lines 55-62 and col. 6 lines 7-20 and 44-64, these layout patterns are read as geometric patterns). It would have been obvious to one skilled in the art to combine the teaching of Takeo et al. to that of Doi et al. because they are analogous in extracting patterns in radiographic images. One in the art would have been motivated to incorporate the teaching, of two mask values, of Takeo et al. to that of Doi et al., in order to determine the rib and diaphragm edges, to eliminate the complication of the recognition algorithm which searches a single irradiation field in each subdivision (Takeo et al.; col. 5 lines 16-20).

Regarding claim 2: A method wherein the geometric pattern corresponding to a position of the irradiation field edge to be detected is used. Examiner refers to claim 1 above.

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Regarding claim 3: A method according wherein in the extraction of said characteristic point, a relation between pixel value of a target pixel and peripheral pixel of said target pixel is compared with said geometric patterns and an irradiation field edge likelihood is scored (Takeo et al.; col. 6 lines 12-17, where each of the two value mask signals and the two value image signals are compared. These values are values of pixels in an image and they are read as a target pixel of interest and another pixel near the target pixel which can be a peripheral pixel. The rating values "scores" between the masks and the image signals are determined). See claim 1 for the obvious and motivation.

Regarding claim 4: A method according wherein in the detection of the edge portion of said irradiation field, a line having a possibility that they correspond to said irradiation field edge is extracted on the basis of said extracted characteristic point. See claim 1.

Regarding claim 5: A method wherein in the detection of the edge portion of said irradiation field, whether said extracted line correspond to said irradiation field edge or not is determined. See claim 3. The rating values gives if this is a pattern in the image or not. The higher the value the higher the chance of it being the edge and vice versa.

Regarding claim 6: A method wherein an image processing condition for said radiation image is set by using data in said detected irradiation field. See claim 1. Once the rib and diaphragm edges are extracted then the edges of the lungs are determined/extracted. By having to extract the edges of the ribs and the diaphragm prior is read as setting a condition.

Regarding claim 7: See claim 1.

Regarding claim 8: See claim 1.

Regarding claim 9: See claim 3.

Regarding claim 10: See claim 3. In order to obtain multiple scores in the plurality of two valued masks with the image signal all the scores obtained obviously need to be placed in a memory so that the one with the highest value can be determined and used.

Regarding claim 11: An apparatus further comprising forming means for radiating a radiation to an object, thereby forming a radiation image (Doi et al.; fig. 2, wherein a object is radiated to obtain a radiated image.).

Regarding claim 12: It is rejected for the same reason as claim 1 above and for the following limitation of a recording medium (Doi et al.; fig. 1B elements 102 and 112).

Regarding claim 13: It is rejected for the combination of reasons of claims 1 and 3.

Regarding claim 14: See claim 3.

Regarding claim 16: See claim 3. Different masks are used to determine a pattern in a radiographic image. By using different value patterns is seen as using different rotated masks.

Regarding claim 17: It is rejected for the combination of reasons of claims 1 and 3.

Allowable Subject Matter

3. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Doi et al. (U.S. patent 5,790,690) for automated feature image analysis.

Jang et al. (U.S. patent 5,268,967) for edge detection in radiographic images.

Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anand Bhatnagar whose telephone number is (703) 306-5914, whose supervisor is Amelia Au whose number is 703-308-6604, group fax is 703-872-9306, and Tech center 2600 customer service office number is 703-306-0377.

AB

Anand Bhatnagar

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May 14, 2004


SAMIR AHMED
PRIMARY EXAMINER